

CLAIMS:

1. A multi-head sewing machine comprising:
a machine table;
a plurality of sewing heads disposed to oppose to the machine table and arranged in a row in a first direction, the first direction being substantially parallel to a surface of the machine table;
a workpiece setting frame arranged and constructed to releasably hold a long workpiece having a predetermined width and a longitudinal direction, the workpiece setting frame being movable within a plane that is substantially parallel to the surface of the machine table; and
a feeding mechanism for feeding the workpiece relative to the workpiece setting frame in a direction substantially parallel to the first direction.
2. A multi-head sewing machine as in claim 1, wherein the feeding mechanism comprises a direction changing device disposed at least one of a forward position and a rearward position in the first direction with respect to the workpiece setting frame.
3. A multi-head sewing machine as in claim 2, wherein the direction changing device is disposed on each of the forward and rearward positions with respect to the workpiece setting frame.
4. A multi-head sewing machine as in claim 2, wherein the direction changing device is arranged and constructed to change the feeding direction of the workpiece between the first direction and a second direction that is substantially perpendicular to the first direction.
5. A multi-head sewing machine as in claim 2 further including structural members, the structural members constituting parts of the sewing machine and disposed on both ends of the machine table in the first direction, wherein the direction changing device is arranged and constructed to change the direction of the workpiece such that the corresponding structural

member disposed on the same side as the direction changing device does not interfere with the workpiece.

6. A multi-head sewing machine as in claim 5, wherein the direction changing device is disposed on the machine table in a position between the workpiece setting frame and each of the structural members.

7. A multi-head sewing machine as in claim 6, wherein the direction changing device is disposed adjacent to the workpiece setting frame.

8. A multi-head sewing machine as in claim 5, wherein the direction changing device is disposed on the workpiece setting frame.

9. A multi-head sewing machine as in claim 5 further including a support frame arranged and constructed to support the sewing heads and having a longitudinal direction in the first direction, wherein the structural members comprise support members disposed on both ends of the machine table for supporting the support frame.

10. A multi-head sewing machine as in claim 2, wherein the direction changing device comprises a bar for engaging the workpiece.

11. A multi-head sewing machine as in claim 10, wherein the bar is a roll bar.

12. A multi-head sewing machine as in claim 10, wherein the bar has a longitudinal axis that is inclined relative to the first direction by a predetermined angle.

13. A multi-head sewing machine as in claim 10, wherein the bar has a longitudinal axis and the direction changing device is arranged and constructed to permit adjustment of an angle of inclination of the longitudinal axis of the bar relative to the first direction.

14. A multi-head sewing machine as in claim 10 further including a direction control device associated with the direction changing device, wherein the direction control device comprises a control bar that is fixed in position and extends in a direction substantially perpendicular to the first direction.

15. A multi-head sewing machine comprising:

- a machine table;

- a plurality of sewing heads disposed above the machine table and arranged in a row in a first direction, the first direction being substantially parallel to a surface of the machine table;

- a workpiece setting frame arranged and constructed to releasably hold a long workpiece having a predetermined width and a longitudinal direction, wherein the workpiece setting frame is disposed between the sewing heads and the machine table and is movable within a plane that is substantially parallel to the surface of the machine table; and

- a feeding mechanism for feeding the workpiece, the feeding mechanism comprising:

- a workpiece supply device;

- a workpiece recovery device; and

- a first direction changing device and a second direction changing device disposed on both sides of the workpiece setting frame in the first direction, wherein:

- the first direction changing device comprises a first bar for engaging the workpiece that has been fed from the workpiece supply device in a second direction that is different from the first direction, so that the feeding direction of the workpiece is changed from the second direction to the first direction by the first bar,

- the second direction changing device comprises a second bar for engaging the workpiece that has been changed in the feeding direction to the first direction by the first direction changing device, so that the feeding direction of the workpiece is changed from the first direction to a third direction that is different from the first direction and is directed toward the workpiece recovery device, and

- the workpiece is fed in the first direction along the workpiece setting frame between the first bar and the second bar.

16. A multi-head sewing machine as in claim 15, wherein the first and second direction changing devices are mounted on the machine table.

17. A multi-head sewing machine as in claim 15, wherein the first and second direction changing devices are mounted on the workpiece setting frame.

18. A multi-head sewing machine as in claim 15 further including:

- a support frame arranged and constructed to support the sewing heads and having a longitudinal direction in the first direction, and

- a first support member and a second support member disposed on both ends of the machine table for supporting the support frame, wherein, the first direction changing device is arranged and constructed such that the first support member does not interfere with the workpiece that extends from the workpiece supply device toward the first direction changing device, and the second direction changing device is arranged and constructed such that the second support member does not interfere with the workpiece that extends from the second direction changing device toward the workpiece recovery device.

19. A method of feeding a long workpiece having a predetermined width in a multi-head sewing machine, the sewing machine comprising:

- a machine table;

- a plurality of sewing heads disposed above the machine table and arranged in a row in a first direction that is substantially parallel to a surface of the machine table;

- a workpiece setting frame arranged and constructed to releasably hold the workpiece, wherein the workpiece setting frame is disposed between the sewing heads and the machine table and is movable within a plane that is substantially parallel to the surface of the machine table;

- a workpiece supply device; and

- a workpiece recovery device, the method comprising:

- feeding the workpiece in a second direction from the workpiece supply device to a first position forwardly of the workpiece setting frame in the first direction, wherein the second direction is different from the first direction,

changing the feeding direction of the workpiece from the second direction to the first direction at the first position;

feeding the workpiece from the first position to a second position in the first direction along the workpiece setting frame, wherein the second position is disposed rearwardly of the workpiece setting frame in the first direction,

changing the feeding direction of the workpiece from the first direction to a third direction at the second position, wherein the third direction is different from the first direction, and

feeding the workpiece toward the workpiece recovery device in the third direction.

20. A method as in claim 19, wherein the first, the second and the third directions are set within a plane that is substantially parallel to the machine table, and the second and third directions are substantially perpendicular to the first direction.

21. A method as in claim 19, wherein the first position and the second position are adjacent to the a front end and a rear end in the first direction of the workpiece setting frame, respectively.

22. A multi-head sewing machine comprising:

a machine table;

a plurality of sewing heads disposed above the machine table and arranged in a row in a first direction substantially parallel to a surface of the machine table;

a workpiece setting frame arranged and constructed to releasably hold a long workpiece having a predetermined width, wherein the workpiece setting frame is disposed between the sewing heads and the machine table and is movable within a plane substantially parallel to the surface of the machine table;

means for supplying the workpiece;

means for recovering the workpiece;

means for feeding the workpiece in a second direction from the supplying means to a first position forwardly of the workpiece setting frame in the first direction, wherein the second direction is different from the first direction,

means for changing the feeding direction of the workpiece from the second direction to the first direction at the first position;

means for feeding the workpiece from the first position to a second position in the first direction along the workpiece setting frame, wherein the second position is disposed rearwardly of the workpiece setting frame in the first direction,

means for changing the feeding direction of the workpiece from the first direction to a third direction at the second position, wherein the third direction is different from the first direction, and

means for feeding the workpiece toward the recovering means in the third direction.